

## **Optimization problems for distribution of resources in spatial systems**

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### **Abstract**

We consider a problem of optimal allocation of a homogeneous resource in spatially distributed systems such as communication networks, where both utilities of consumers and network expenses must be taken into account. This approach leads to a two-objective optimization problem, which involves non-differentiable functions whose values are computed algorithmically. We propose several approaches to define a solution and to construct corresponding solution methods for such problems. In particular, new subgradient methods for non-differentiable Pareto optimization problems are suggested. Their work is illustrated by computational results on test problems.

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### **Keywords**

Multi-objective optimization, Non - differentiable functions, Resource allocation, Solution methods, Spatial systems